Evolution of a Mission Plan

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Abstract

A prototype Decision Support System for Coalition Operations (DSCCO) is being developed by the Space and Naval Warfare Systems Center, San Diego, to support the Operations Planning Team (OPT) of the Commander in Chief, United States Pacific Command (CINCPAC). The goal of DSCCO is to apply and integrate organizational design concepts and decision support technologies in planning and executing multi-national coalition operations. Employing a user-centered design approach, DSSCO researchers have developed a multi-component toolset. The Planning Module functions as a surrogate expert planner and guides OPT personnel through the evolution of a mission plan using the Crisis Action Planning process. DSSCO's supporting resources include a *Coalition Planning Guide* and access to relevant information regarding coalition partners and other organizations with whom the U.S. military must interface during a coalition operation. The Task Visualization Module presents the plan. It provides a collaborative display that enables distributed coalition forces to maintain shared situation awareness in real-time of their own activities in relation to those of other organizations.

This paper describes the DSSCO toolset and the functional support it will provide to the OPT.

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Introduction

DSSCO is a prototype toolset to facilitate planning for coalition operations. It can be integrated with a collaborative planning system to provide planners with an interactive view of an ongoing planning process. DSSCO provides support to the Operations Planning Team (OPT) of the Commander in Chief, U. S. Pacific Command (CINCPAC). The OPT has responsibilities to plan for missions that are responses to crisis situations within PACOM's area of responsibility (AOR). PACOM's AOR is extensive, covering 105 million square miles and including 43 countries and territories. When an event occurs within this AOR that has possible national security significance, the situation is tracked and decisions are made about U.S. military involvement. If there is national interest in pursuing military response options, a doctrinally-defined[1] Crisis Action Planning (CAP) process is initiated to build a mission plan. By its very nature, planning for response to a crisis implies performance under rigorous time constraints. Adding to the complexity of the planning process is the frequent inclusion of multi-national forces in the operation. The goal of DSCCO is to provide organizational design concepts and decision support technologies that simplify and streamline planning for multi-national coalition operations.

Employing a user-centered design approach, DSSCO researchers have developed a tool that presents planners with an interactive presentation of an ongoing CAP process for coalition operations. This DSSCO Planning Module provides an overview, guidance, and status of the CAP process for a specific operation (Figure 1). The Planning Module suggests activities that should be performed to build an effective coalition. Information regarding potential coalition partners and the coalition building process is provided at relevant points in the planning process. In addition, planners have tools (a TaskSelector and the Task Visualization Module) for preparing and visualizing the mission plan; i.e., the tasks that comprise the proposed course of action. This mission plan evolves as the multiple specialists in the OPT, and later the Commander, Combined Task Force (CCTF), progress through the CAP process.
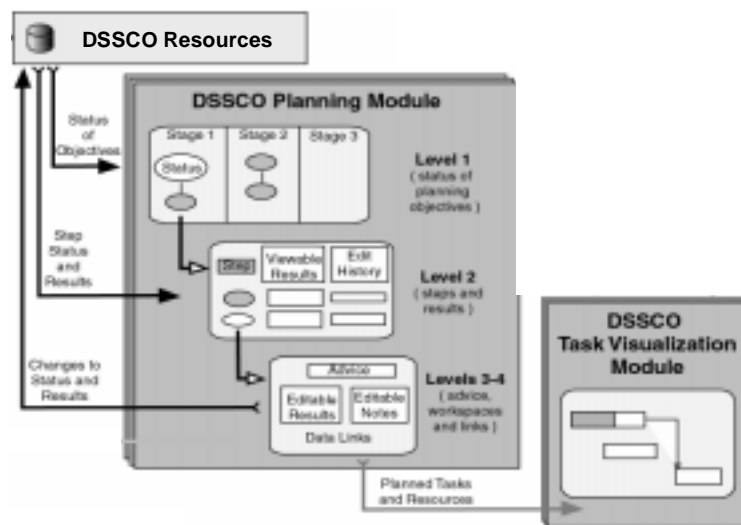

Figure 1. Components of the DSSCO Toolset

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[1] The Joint Staff. (1995 April). *Doctrine for Planning Joint Operations*, Joint Pub 5-0, Washington, D.C.

Guidance for the CAP Process: The DSSCO Planning Module

Involvement of the U.S. military in multi-national operations is increasing. The U.S. Navy Chief of Naval Operations, ADM Jay Johnson, stated in November 1999: "…we expect coalitions to play an increasingly important role in international security…this shift toward coalition operations…demands the greatest degree of transparency in our (U.S.) operations…" [1] However, analysis suggests that coalition operations still are often planned in a unilateral manner, with resultant problems that negatively affect these operations.[2] The DSSCO Planning Module—the "home base" of the DSSCO toolset— was designed to provide multi-level decision support. It presents the basic CAP process (Figure 2) and highlights coalition-specific features. Its purpose is to structure knowledge for planning and executing an effective coalition operation. It has been designed so that users without extensive experience in coalition planning can efficiently collaborate to build a mission plan.
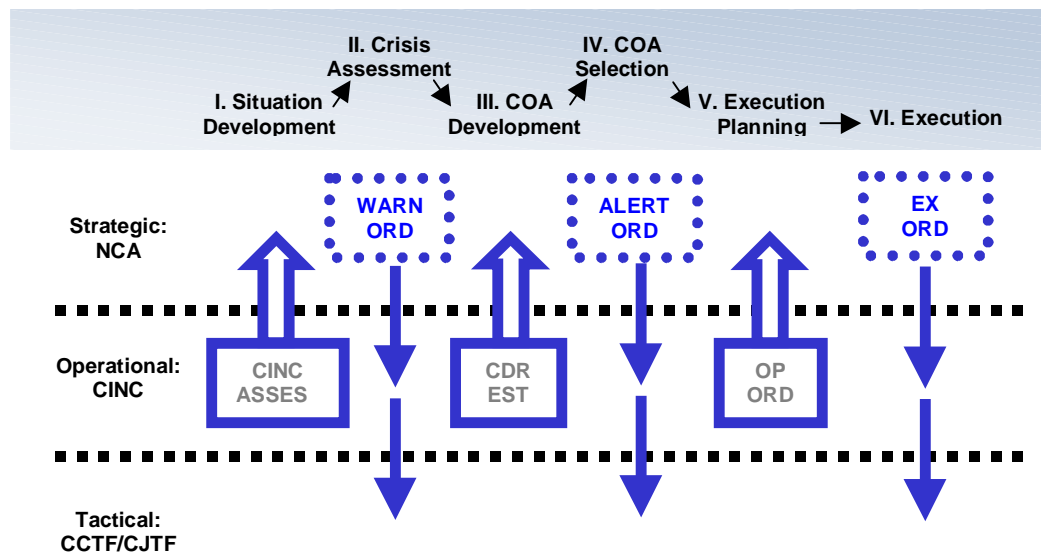

Figure 2. Overview of the Crisis Action Planning (CAP) Process

A map of the CAP process comprises the top level of the Planning Module (see Figure 3). The name of the operation, shown in Figure 3 as "Restore Order," is displayed prominently. The flow diagram of the process for the CINC-level OPT reads from left to right, with the corresponding doctrinal phase labels shown mid-display. The boundary for interactions with the Chairman, Joint Chiefs of Staff and National Command Authorities (the President and the Secretary of Defense, designated as NCA on the process map) is shown at the top of the display. The boundary for interactions with the CCTF, the commander of the specific mission, is shown at the bottom. For our discussion, the CCTF is also the U.S. Joint Task Force Commander (CJTF).

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[1] Johnson, J. L. (1999 November). *Keynote Address at the International Seapower Symposium*, Naval War College, Newport, RI.
[2] Heacox, N. J., O'Mara, W. J., & Kelly, R. T. (1999 January). *Information Support for Coalition Operations Other Than War.* San Diego, CA: Pacific Science & Engineering Group.
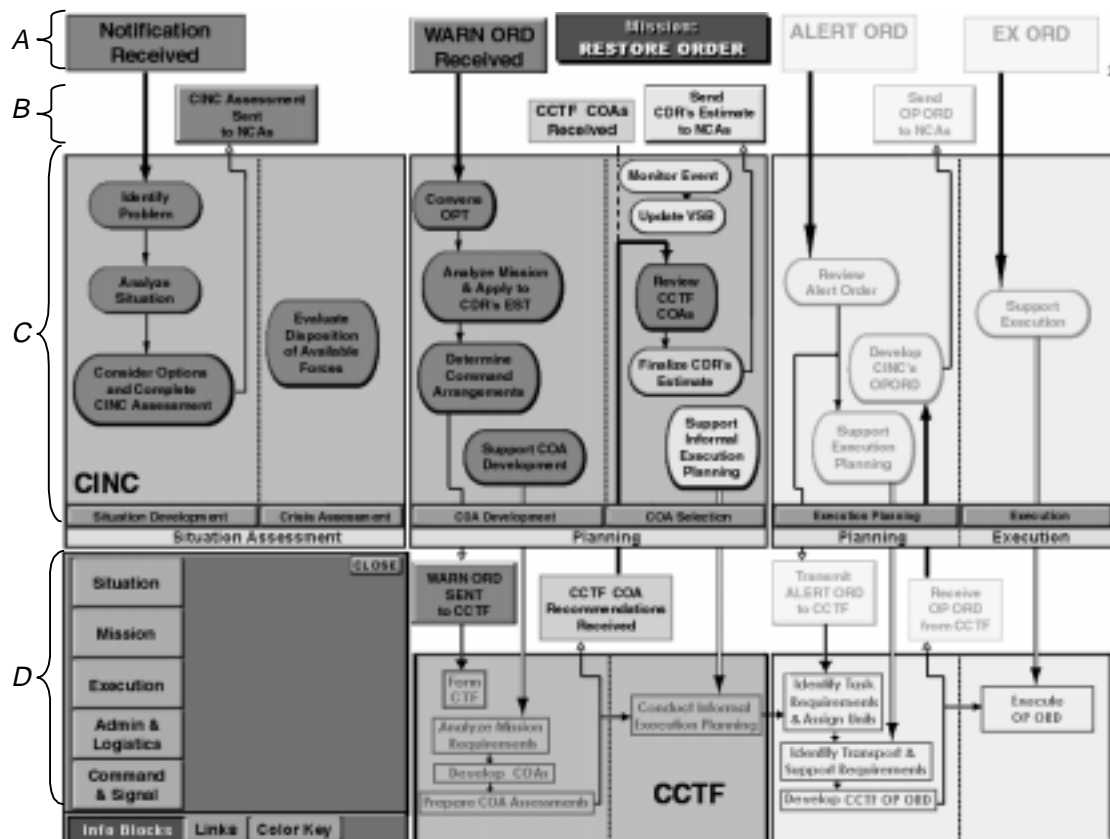
Figure 3. Top level of the DSSCO Planning Module.

Note: A = event triggers; B = CINC planning products; C = CINC objectives; D = information blocks. (See text for detailed explanations.)

Triggers are events that initiate each phase of the planning process for the CINC-level planners (see A in Figure 3). Triggers may be world events or they may be standardized message documents that the NCA sends to CINC-level planners during the planning process. Triggers are shown as boxes with arrows leading into the process diagram. In Figure 3, two triggers have been received: (1) notification of external event, and (2) the WARN ORD (Warning Order).

Planning products are the standardized message documents that the CINC-level planners produce and send to the NCA and CJTF during the planning process (see B). These products represent milestones in the evolution of the mission plan. Planning products are shown as boxes with arrows leading out from the process map. In Figure 1, the CINC Assessment has been sent in response to the first trigger, and the planning staff is working on the Commander's Estimate.

Information blocks (see D) are an up-to-date compilation of information grouped by topical area. These topical areas are relevant to sections of the planning products. Planners can access these information blocks at any time to see the latest entries in a topical area without searching through planning products or through the workspaces.

Objectives are goals that should be accomplished by the planners as the planning process progresses through its various phases (see C: objectives are the buttons within the process map; i.e., 'Identify Problem' and 'Analyze Situation').

The status of the planning process is displayed at Level 1 so that distributed planners can track its progress. A color coding scheme allows planners to track the status of triggers, planning products, and objectives.

Planners drill down through the objectives buttons to Level 2, where information about a single planning objective is displayed as a set of steps (see Figure 4).

Figure 4. Level 2 of the DSSCO Planning Module.

Note: E = steps; F = information summaries; G = history or user notes summaries.

Steps are actions that can be completed to meet an objective (see E in Figure 4). Often, requirements to complete a step involve the gathering of information for a planning product. Level 2 shows a summary of work completed so far on each step (F), a history of information additions (G) and planners' notes (a toggle at G).

The third level of the Planning Module displays a workspace for each step (see Figure 5). At this level, information is available to help planners locate and store information necessary to complete the step.
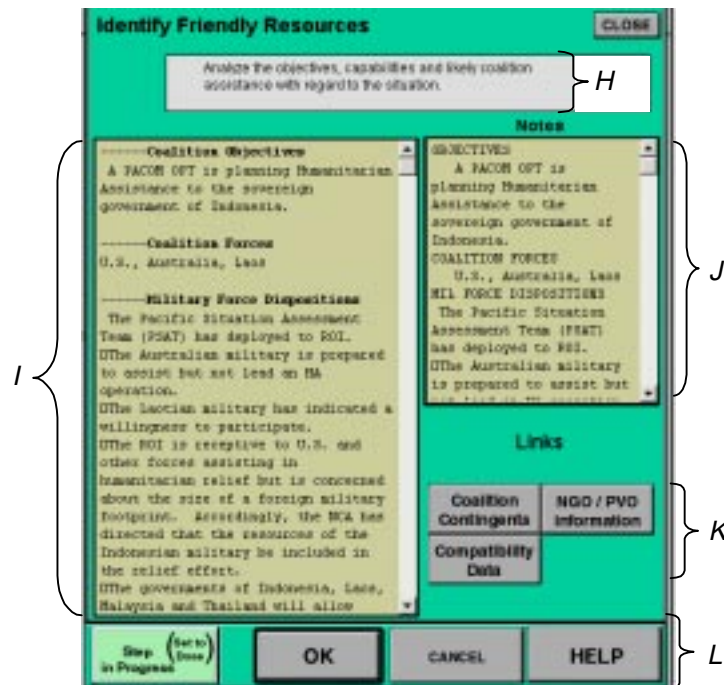
Figure 5. Level 3 of the DSSCO Planning Module.

Note: H = instructions; I = information entry and storage box; J = user notes box; K = reports; L = workspace-relevant Help.

Each workspace includes an advice box with general instructions for completing the step (see H in Figure 5). An information entry and storage space is provided (I). This space is either a list of response choices or a text box. There is also a text box for user notes (J).

Links to other DSSCO information sources relevant to a step are displayed as buttons that can be pushed to show the information collected on coalition–related topics (see K). Two types of reports are currently available. Country "Compatibility" Reports display cultural and political information about countries involved in the situation. Contingent Reports describe coalition military contingents, enemy contingents, and Non-Governmental Organizations/Private Volunteer Organizations (NGOs/PVOs). These reports provide planners with a well-organized distillation of pertinent information—much of it available through a DSSCO resource database—in a single location. The reports also provide a structure for planners to input information that is not available in a DSSCO resource database. Many of the reports are multi-level, with drill downs available to more detailed information. An NGO/PVO report (see example at Figure 6) displays:

- information about specific units known to be in the area of operations (e.g., for Medicins San Frontieres—also known as Doctors without Borders—a 5-member medical unit is available immediately)

- information about their capabilities so that resource usage can be optimized

- prior experience so that planners can understand their history of involvement in similar situations

Contingent Profiles (NGO/PVO)   CLOSE

	CARE	ICRC	MSF	OXFAM
Unit Type			Medical	
Unit Size			5 member Team	
Date Available	Immediate	Immediate	Immediate	Immediate
Capabilities				
Priorities	Acute Aid, Long Term Assistance	Protection, Acute Aid, Long Term Assistance	Acute Aid, Long Term Assistance	Long Term Assistance
Liaison Ability	Yes	Yes	Yes	Yes
Language	English, Host country	English, Host country	English, Host country	English, Host country
Communications	Satellite	Email, Telephone, Radio, Satellite	Email, Telephone, Radio	
Transportation	Organic	Organic	Organic	
Messing	Organic	Organic	Organic	
Medical	Organic	Organic	Organic	
Equipment				
Basic Needs	No	No	No	
Supplies	No	No		
Prior Experience (Country)	Expand	Disaster Relief, Protection, Roundtable on Disarmament	Expand	Education, Protection

Figure 6. Example NGO/PVO Contingent Report

'Help' (see L in Figure 5) is available at most workspaces, and provides more detailed instructions and supporting information from the *Coalition Planning Guide (CPG)*. The *CPG* is a DSSCO resource that contains guidance for planning and executing coalition operations. It contains the following information:

- CAP procedures and a concept of operations of coalition operations
- advice about alternative command and control arrangements and integration strategies for coalition operations
- templates for planning products
- annexes that detail:
  - liaison team compositions and PACOM designated contingency CJTF/CCTFs
  - procedures and suggested doctrinal areas for combined operations
  - planning and management procedures for: combined communications, intelligence support, administration and logistics, and training
  - definitions, acronyms and abbreviations commonly used in coalition operations

Task Development: The DSSCO TaskSelector and Task Visualization Module

Early in the course of the DSSCO toolset development, subject matter experts emphasized that an effective mission plan evolves based on the needs of the crisis situation. When building a mission plan, expert planners currently bring together their knowledge of the situation and recall from experience the tasks that comprised successful missions or the pitfalls that placed them at risk. The DSSCO Planning Module functions as a surrogate expert planner and provides users with guidance for selecting tasks for the evolving plan, based on relevance of the tasks to the type of situation. The types of

operations described in Joint Pub 3-07, *Joint Doctrine for Military Operations Other Than War*,[3] were used as the basis for developing DSSCO's task selection features.

Analysis of common mission tasks led to the realization that there are two basic categories of tasks: those that apply to any type of coalition operation, and those that represent specific responses to situation needs. The first category includes: pre-deployment, operation-wide coordination, disengagement and handover of efforts, and redeployment. The second category, the situation-specific category, contains tasks that are planned and conducted based on the needs and constraints within a defined geographical area. These are designated as 'sector tasks,' based in part on the common practice of dividing a coalition area of operations into separate sectors with concomitant separation of command and control responsibilities. Hierarchical task blocks were developed for each of these task types, and they are available to planners as the mission plan evolves.

The TaskSelector is a part of the Planning Module (see Figure 7). It contains categorized listings of the hierarchical task blocks, grouped by their relevance to specific missions and situations (see M in Figure 7). It also allows, through the 'edit' feature, planners to view types of units needed and relevant contact information (see N). In addition, task assignments can be made through the TaskSelector. These features assist planners in beginning the development of the mission plan early in the planning cycle.
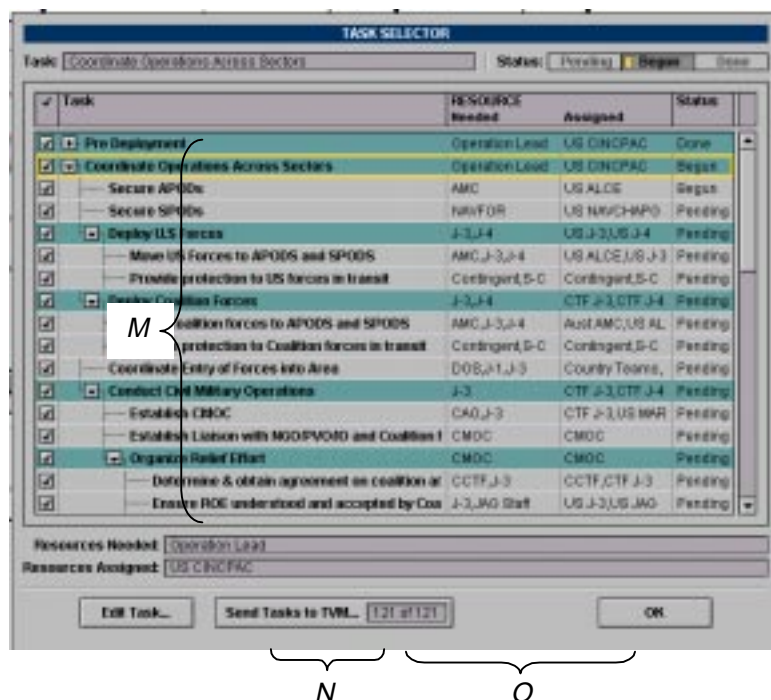

Figure 7. DSSCO TaskSelector.

Note: M = hierarchical task blocks; N = button to view editing box; O = button to send selected tasks to TVM.

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[3] The Joint Staff (1995 June). *Joint Doctrine for Military Operations Other Than War*, Joint Pub 3-07, Washington, D.C.

Task blocks can be sent from the TaskSelector to the Task Visualization Module (TVM) (see O in Figure 7). The TVM displays the tasks in a Gantt chart format. Figure 8 shows a TVM plan that has been sent to MicroSoft Project to display a mission Gantt chart.

Task names are displayed in the TVM (shown at P in Figure 8).

The schedule bar (shown at Q) shows the scheduled duration and timing (start date and end date) of each task.

The resources required section (shown at R) shows the type of resource that has been determined to be necessary to perform the task. This normally is the type of unit that should be assigned.

The resources assigned section (shown at S) lists the actual unit(s) that have been assigned to perform the task.

In the MicroSoft Project TVM, task dependencies are indicated by arrows linking tasks (see example at T, which indicates that 'Deploy U.S. Forces' and 'Deploy Coalition Forces' are dependent upon completion of 'Secure APODs and SPODs'—aerial and sea ports of debarkation).
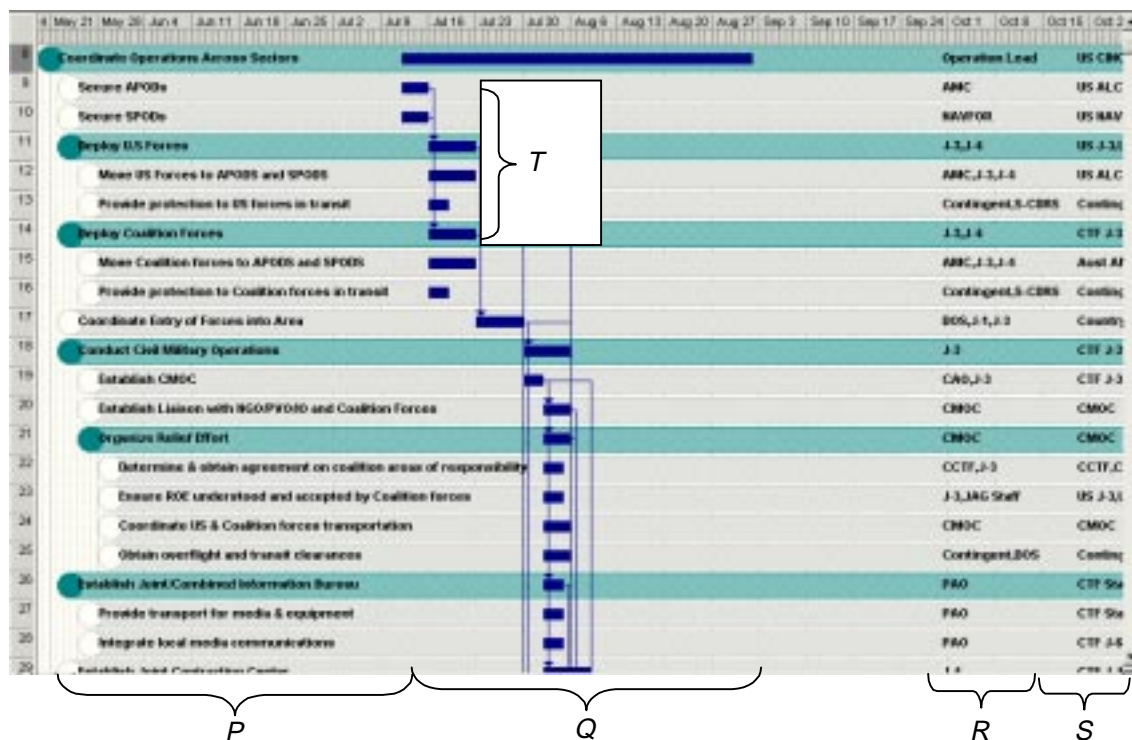

Figure 8. Task Visualization Module.

Note: P = task names; Q = schedule bar; R = resources required; S = resources assigned; T = task dependencies.

As the Plan Evolves: Use of the DSSCO Toolset

The following sections highlight DSSCO's use in the six phases of crisis response: situation development, crisis assessment, course of action (COA) development, COA selection, execution planning, and execution of the operation.

Situation Development

The Situation Development phase begins when an event and/or intelligence indicators occur that have possible national security implications for the U.S. or any of its allies or coalition partners. It ends when the CINC Assessment of the situation is submitted to the NCA. The focus of the activity in this phase is on the CINC-level OPT.

The DSSCO Planning Module indicates that Phase 1 is active when notification of the trigger event has occurred. As planners work on monitoring and assessing the situation, information can be entered and read at the Phase 1 steps. DSSCO also assists planners in beginning the development of the mission plan early in the planning cycle. Based on the description of the type of situation, suggestions of appropriate task blocks are provided. Planners can accept or reject any of these tasks and their subtasks. Via the TaskSelector, they can view a pool of resources needed, and choose from these to make resource assignments. This facilitates the efficient use of resources and establishes a continuous trail of development of the plan. Much information about potential coalition partners is available through DSSCO reports and resource databases. In addition, the *CPG* provides valuable suggestions about building a successful multi-national force.

The product of Phase 1, the CINC Assessment, is available to planners via the Planning Module. They can access a template with defined fields, and they can view and edit the document as it is drafted. Planners can track the status of each milestone in the planning process. In addition, they can view a collated summary of information at the Information Blocks. Information is displayed in chronological order of entry, sorted into the five paragraph format familiar to planning and operations personnel; that is, 'Situation,' 'Mission,' 'Execution,' 'Administration & Logistics,' and 'Command & Signal.'

Crisis Assessment

The Crisis Assessment phase begins when the NCA receives the CINC Assessment. It ends when the NCA makes a decision to return to the pre-crisis situation or to have military options developed for their consideration. The focus of activity in this phase is on the CJCS and NCA. The OPT continues to monitor the event and apprises the NCA of significant new information; in addition, they begin to evaluate the disposition of available forces. DSSCO workspaces provide guidance for these activities.

COA Development

The COA Development phase begins when the NCA decides to pursue military options and publishes a Warning Order (WARN ORD) that directs the development of COAs in response to the situation. It ends when the CINC submits a Commander's Estimate to the NCA with recommended and alternative COAs. The focus of activity in this phase is on the CINC-level coalition planners and the CCTF.

Planners can utilize DSSCO workspaces to guide them through mission analysis, determination of sound command arrangements, and analysis of the COAs that have been drafted in conjunction with the CCTF and coalition partners. As the planning process progresses, the tasks that comprise the evolving mission plan can be viewed with the TVM in a Gantt chart format. Here, planners can manipulate the duration of tasks, which are shown as bars against the mission timeline. Resource information and interdependencies between tasks are visible and facilitate monitoring the plan.

As with the CINC Assessment, a template of the Commander's Estimate with defined fields can be accessed through the Planning Module. Planners can view and edit the document as it is drafted.

COA Selection

The COA Selection phase begins when the CINC submits a Commander's Estimate to the NCA with recommended and alternative COAs. It ends when the NCA selects a COA and issues the selected COA in an Alert Order (ALERT ORD). The focus of activity in this phase shifts back to the CJCS and NCA. Meanwhile, the CINC transmits guidance to supporting and subordinate commanders for execution of the COAs, with emphasis on the recommended COA, in preparation for receiving the ALERT ORD or Planning Order (PLAN ORD). In conjunction with coalition partners, these activities include refinement of deployment estimates and resolution of identified shortfalls.

Execution Planning

The Execution Planning phase begins when the supported commander receives an ALERT ORD or PLAN ORD. It ends when the CINC issues an Operation Order (OP ORD). As with other CINC-level products, a document template is accessible through the DSSCO Planning Module. The focus of activity in this phase is on the CINC-level coalition planners and CCTF.

The mission plan is fully developed for force deployment at this stage of the planning process. Completion and validation of the deployment time-phased force and deployment data (TPFDD) should coincide with finalization of the mission plan depiction in the DSSCO TVM for distribution outside of the OPT. For coalition partners, filters can be applied in accordance with viewing rights so that only specified parts of the mission plan are visible.

Execution

The Execution phase begins when the NCA issues an Execute Order (EX ORD) to execute the OP ORD. It ends when the crisis situation has been resolved.

It is intended that the TVM will be distributed to in-theater forces. It will provide a collaborative display that enables distributed coalition forces to maintain shared situation awareness in real-time of their own activities in relation to those of other organizations. Thus, it will function as a monitoring aid, and will facilitate replanning by the coalition partners in response to a changing situation.

Summary

To meet the goal of applying and integrating organizational design concepts and decision support technologies to the process of planning and executing multi-national coalition operations, a prototype DSSCO toolset has been developed. This toolset has the following features:

- Represents a coalition planning process for the OPT
  - Presents a map of the process
  - Identifies information needs
- Tracks the status of the coalition planning effort
  - Presents the status of objectives and steps, triggering events, and products
  - Automatically compiles information summaries
- Provides tools for coalition planning
  - Displays workspaces for information input with instructions & prompts
  - Presents suggestions for appropriate tasking, linked to type of situation
  - Facilitates visualization of scheduled tasks
  - Makes available advice about coalition planning, coalition partners and NGOs/PVOs
- Provides a common environment to enable indirect coordination of planning activities
  - Displays steps & workspaces organized by category
  - Shows a history of information additions
  - Allows for information sharing with other planners
  - Displays work progress

The DSSCO toolset has application potential for planning, operations, and training.